

## PATENT ABSTRACTS OF JAPAN

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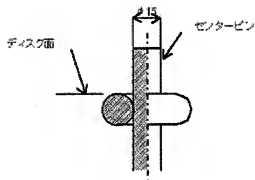
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(54) BASE MOUNT USED FOR MANUFACTURING OF OPTICAL DISK, LAMINATE DEVICE EQUIPPED THEREWITH, AND MANUFACTURING METHOD OF OPTICAL DISK

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a base mount to be used for fixing and keeping a substrate suppressing transformation such as a warp arising when laminating without shrinkage of an adhesive agent (failure of spread) which may cause peeling away of the adhesive agent, and consequently enabling manufacturing of a contact laminate type optical disk excellent in mechanical characteristics and keeping reliability at a low cost, and to provide a laminating device using thereof, and a manufacturing method of an optical disk.

SOLUTION: The base mount is used to fix and keep a substrate in manufacturing of an optical disk laminated of a first transparent substrate having a central hole and a recording and reproducing layer, and a second transparent substrate having a central hole with interposition of an ultraviolet cure adhesive by irradiation with ultraviolet rays. The base mount for manufacturing the optical disk is characterized in that it has a structure to fix and keep the first substrate leaving space between the base mount face and the first substrate face so as not to generate heat storage to the extent to make a columnar center pin set to fix and keep the substrate by being inserted in the center hole to cause the transformation at least for the first substrate disposed at the base mount side.



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CLAIMS

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[Claim(s)]

[Claim 1]The 1st transparent substrate that has a feed hole and with which record and a reproduction layer were provided, and the 2nd transparent substrate that has a feed hole an optical disc which makes UV cure adhesive intervene and was stuck, When manufacturing by UV irradiation, it is a pedestal used in order to carry out fixed holding of the substrate, So that accumulation to the extent that it becomes a factor which modification generates in the 1st substrate with which a pillar-shaped center pin which inserts in a feed hole and carries out fixed holding of the substrate is provided, and this center pin is arranged at least at the pedestal side may not happen to a pedestal, A pedestal for optical disc manufacture being what has the structure which builds an interval to a pedestal side and the 1st substrates face, and can carry out fixed holding of the 1st substrate.

[Claim 2]The pedestal for optical disc manufacture according to claim 1, wherein a center pin is a hollow structured.

[Claim 3]A laminating apparatus for manufacture of an optical disc, wherein a black light is formed in the pillar-shaped center-pin side upper part of the pedestal for optical disc manufacture according to claim 1 or 2, and this pedestal.

[Claim 4]A pillar-shaped center pin of the pedestal for optical disc manufacture according to claim 1 or 2, Record and a reproduction layer are carried out inside for the 1st transparent substrate that has a feed hole and with which record and a reproduction layer were provided, and the 2nd transparent substrate that has a feed hole, A manufacturing method of an adhesion lamination type optical disc characterized by carrying out UV irradiation from the upper part of the 2nd substrate in the state where inserted in a feed hole one by one, carried out fixed holding, and UV cure adhesive was made to exist between the 1st substrate and the 2nd substrate.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the manufacturing method of the pedestal for carrying out fixed holding of the substrate, the laminating apparatus using it, and an optical disc used for the manufacturing process of an adhesion lamination type optical disc.

[0002]

[Description of the Prior Art]Although the former, for example, CD-ROM, CD-R, and CD-RW have been used as an optical disc for recording media of a digital signal, In recent years, the demand of the media which can record the large amount of information follows on rising, and the optical disc of the adhesion bonding type is manufactured and used like DVD-ROM, DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, and DVD-VIDEO as a high-density optical disc.

[0003]An adhesion bonding type optical disc is what pasted two substrates together with adhesives, and that by which record and a reproduction layer were prepared for one side or the both sides of the two substrates is usually used. As a material used for formation of record and a reproduction layer, it changes with recording methods and there are organic-coloring-matter material, an optical magnetic adjuster, a phase change material, etc.

[0004]Next, a phase change recording type optical disk is taken for an example, and an adhesion bonding type optical disc is explained. Although it comprises material which has the character in which a record reproduction layer changes a phase change recording type optical disk to a crystallized state and an amorphous state reversibly, and reflectance changes with them, It is applicable to technical matters other than the record reproduction layer explained below also to the optical disc of other recording methods. A phase change recording type optical disk has section composition as shown, for example in drawing 1.

On a base (11), a protective layer (12), a record reproduction layer (13), a protective layer (12), A thing (it is called the 1st substrate) is really which provides a metal layer (14) and an organic

protective layer (15) one by one created, a glue line is made to intervene, and this 1st substrate and a protective group board (17. it is called the 2nd substrate) are stuck and obtained in it.

[0005]As a material used for forming a record reproduction layer, Since it is required for record (amorphous-izing) sensitivity and speed, elimination (crystallization) sensitivity and speed, and an elimination ratio to become good, that which can cause the phase change of a crystal-amorphous interphase and in which each can take stabilization or a metastable-ized state is suitable. It not only can record and eliminate, but as a phase change type optical recording reproduction layer, the life (reliability) of the reproduction stability of a signal when it records in high density and a high-linear-velocity field, or a signal is required simultaneously. As a phase change type optical recording reproduction layer which can satisfy these synthetically, GeSbTe, AgInSbTe, GeInSbTe, etc. which use SbTe as the main ingredients are commercialized.

[0006]As thickness of a record reproduction layer, it is good to be suitably referred to [ 10-50-nm ] as 12-30 nm, and when initial characteristics, such as a jitter, an overwrite characteristic, and mass production efficiency are taken into consideration, it is still more preferred to be referred to as 14-25 nm. When it becomes thinner than 10 nm, there is a tendency for optical absorption ability to fall remarkably and to stop playing a role of a record reproduction layer. When thicker than 50 nm, there is a tendency for a uniform phase change to become difficult to happen at high speed. Such a record reproduction layer can be formed with various vapor phase growth, for example, a vacuum deposition method, sputtering process, plasma CVD method, an optical CVD method, the ion plating method, electron beam evaporation method, etc. Especially, sputtering process is excellent in mass production nature, membraneous quality, etc.

[0007]Although it is usually an about about 0.6\*\*0.05-mm thing although the thickness of the base (11) used for the 1st substrate is not restrictive, and glass, ceramics, or resin is used as construction material, a resin thing is preferred in respect of moldability and cost. As resin, although polycarbonate resin, an acrylic resin, an epoxy resin, polystyrene resin, acrylonitrile styrene copolymer resin, polyethylene resin, polypropylene resin, silicon system resin, fluororesin, ABS plastics, urethane resin, etc. are mentioned, Polycarbonate resin, acrylic resin, etc. are preferably used especially in respect of moldability, an optical property, and cost.

[0008]A protective layer (12) has the function to adjust the heat of a record reproduction layer, and an optical property with protection of a record reproduction layer, The thickness of the 1st protective layer (12) formed between the plastic plate (11) and the recording layer (13) is good to be referred to as 65-130 nm, and good to be suitably referred to [ 10-40-nm ] as 15-35 nm

as the 2nd protective layer (12) formed between the recording layer (13) and the metal layer (14). As a material which constitutes a protective layer (12), metallic oxides, such as  $\text{SiO}_2$ ,  $\text{ZnO}$ ,  $\text{SnO}_2$ , aluminum $_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{In}_2\text{O}_3$ ,  $\text{MgO}$ , and  $\text{ZrO}_2$ , Nitrides, such as  $\text{Si}_3\text{N}_4$ ,  $\text{AlN}$ ,  $\text{TiN}$ ,  $\text{BN}$ , and  $\text{ZrN}$ , Carbide, and diamond-like carbon or those mixtures, such as sulfides, such as  $\text{ZnS}$ ,  $\text{In}_2\text{S}_3$ , and  $\text{TaS}_4$ ,  $\text{SiC}$ ,  $\text{TaC}$ ,  $\text{B}_4\text{C}$ ,  $\text{WC}$ ,  $\text{TiC}$ , and  $\text{ZrC}$ , are mentioned. Although such materials can also be alone made into a protective layer, they are good also as a mutual mixture. An impurity may also be included if needed. A dielectric layer can also be multilayered if needed. However, the melting point needs to be higher than a record reproduction layer. As such a material, it can form with various vapor phase growth, for example, a vacuum deposition method, sputtering process, plasma CVD method, an optical CVD method, the ion plating method, electron beam evaporation method, etc. Especially, sputtering process is excellent in mass production nature, membraneous quality, etc.

[0009]As a material of a metal layer (14), metallic materials, such as  $\text{Ag}$ ,  $\text{Au}$ ,  $\text{Pt}$ , aluminum,  $\text{Ta}$ , and  $\text{Cu}$ , or those alloys can be used. As an alloying element,  $\text{Cr}$ ,  $\text{Ti}$ ,  $\text{Si}$ ,  $\text{Cu}$ ,  $\text{Ag}$ ,  $\text{Pd}$ ,  $\text{Ta}$ , etc. are used. Such a metal layer can be formed with various vapor phase growth, for example, a vacuum deposition method, sputtering process, plasma CVD method, an optical CVD method, the ion plating method, electron beam evaporation method, etc. As thickness of a metal layer, it is good to be suitably referred to [ 70-200-nm ] as 100-160 nm.

[0010]As a material of an organic protective layer (15), the acrylic (meta) ultraviolet curing type resin etc. which were produced in the spin coat are common, and it presses down so that a recording layer (13) may not be destroyed at the time of oxidation protection of a reflection film (14) and initialization. 5-15 micrometers is suitable for the thickness.

[0011]As for a glue line (16), acrylic (meta) UV cure adhesive is used preferably, and a glue line (16) may serve as an organic protective layer (15).

[0012]Being used in order that a protective group board (17. the 2nd substrate) may give a high mechanical strength to an optical disc, and using the thing about about 0.66\*\*0.05 mm thick made from a plastic may use the same thing as the base (11) unproduced a film preferably.

[0013]The record reproduction layer membrane (13) is usually initialized in one of stages, before and after pasting a protective group board (the 2nd substrate (17)) together via a glue line (16). Although lamination of the protective group board (the 2nd substrate) is performed using hot melt adhesive, cationic polymerization nature adhesives, radical polymerization nature adhesives, etc., the UV cure adhesive which is one of the radical polymerization nature adhesives is especially used widely from the field of the cost of material and a laminating apparatus.

[0014]Next, although the example of a series of work which pastes together the 1st substrate (the substrate arranged to the pedestal side is said) and the 2nd substrate is explained using

the conventional laminating apparatus, It is known that the laminating operation mentioned here can be applied also to the optical disc of not only a phase change record type but other recording methods. Usually, as laminating operation is shown in drawing 3, four positions of supply, exposure, discharge, and cooling are patrolled, it is advanced, and exposure is performed by the conventional black light shown in drawing 2. To first, the film surface of the disc-like plastic plate (the 1st substrate) which produced the record reproduction layer. After really which piles up a protective group board (the 2nd substrate) and is formed after applying UV cure adhesive preparing a thing, It arranges so that eccentricity of the thing may not really [ this ] be mechanically carried out to the  $\phi 14.99$ -15mm pillar-shaped center pin (22) provided in the center of a pedestal (21) in the supplying position shown in drawing 3 using  $\phi 15$  - the 15.01-mm feed hole which were established in both boards.

[0015]In the place where adhesives spread between substrates in prudence and capillarity of the protective group board (the 2nd substrate). It irradiates with the ultraviolet rays (dashed line arrow) which used mercury or a metal halide lamp (23) as the light source, and were collected with the reflective condensing plate (24) from the protective group board (2nd substrate) side upper part, and the light which penetrated the protective group board (the 2nd substrate) reaches adhesives, and stiffens them, and adhesion is completed. After the laminating operation explained above had arranged the 2nd substrate after applying adhesives on the 1st substrate arranged on a pedestal, it was performed in an order which carries out UV irradiation, but. After arranging the 1st substrate and the 2nd substrate one by one on a pedestal, and injecting adhesives into the 1st substrate and the 2nd substrate from between, carrying out UV irradiation is also known. It is publicly known that there is a disk which provided the record reproduction layer not only in the 1st substrate but in the 2nd substrate.

[0016]However, if laminating operation is done using the pedestal for the conventional substrate fixed holding as shown in drawing 4, the large disk of modification like curvature is made and the interval of a substrate spreads in an inner periphery further -- adhesives -- being over (poor breadth) -- it occurs, and does not remain in an appearance defect, but becomes a factor of peeling of adhesives, and the reliability of a disk may be reduced. Although it is possible as modification preventive measures to take long cool time, It is considered as the method of a tact time becoming long, productivity worsening, and it being connected with a cost hike, and also taking long cool time, and also becomes increasing the number of stages of a pedestal or adding the cooler style of air cooling and water cooling, and equipment will become large-scale and will be this and a cost hike.

[0017]Many things are proposed from the former as such modification preventive measures besides taking long cool time. For example, to JP,2001-84654,A, the method of carrying out UV irradiation is indicated, pressing the flat member of a light transmittance state lightly to a substrate, and correcting it mechanically to it reducing heat modification of the substrate at the

time of UV irradiation. To JP,2001-14736,A. Before pasting the 1st substrate and the 2nd substrate together by UV irradiation, if it back-cools, the purport that the substrate made a peculiar target and the curvature which it has potentially reveal beforehand by heat treatment and that heat-treats and it is pressed down by generating of slight curvature as compared with a case is indicated. However, these do not bring about sufficient effect for the curvature occurrence prevention of a substrate.

[0018]

[Problem(s) to be Solved by the Invention]SUBJECT of this invention can control modification of the curvature etc. which are produced when solving and pasting this problem together, and the adhesives leading to peeling of adhesives – being over (poor breadth) – there being nothing and, It is providing the manufacturing method of the laminating apparatus using the pedestal and it which use the adhesion bonding type optical disc which was excellent in a mechanical characteristic and preservation reliability as a result for the fixed holding of a substrate whose manufacture is moreover enabled at low cost, and an optical disc.

[0019]

[Means for Solving the Problem]this invention person examined a factor which modification of curvature of a substrate, etc. generates. Direct contact is carried out to a field of a pedestal, it is fixed to it, and an optical disc (said one thing) before hardening supplied to the conventional pedestal as shown in drawing 4 in a supplying position shown in drawing 3 moves to an exposure position, and after UV irradiation is carried out there, adhesives harden, and are stuck and it becomes a product, it is removed in a discharge position. After that, although it is cooled in a cooling position and a pedestal is returned to the original supplying position, If it is continuously repeated in order that these work of a series of may produce many optical disc products, In order to check that heat will be gradually accumulated in a pedestal, and for the accumulation to become a factor, to expand, and for the 1st substrate fixed to a field of a pedestal by carrying out direct contact to be in a state like drawing 5 and to harden adhesives of an adhesion side between substrates in an instant mostly further, When exposed in this state, it became clear that an optical disc with modification was manufactured.

[0020]This invention is made based on such an analysis result, and an aforementioned problem, (1) of this invention "the 1st transparent substrate that has a feed hole and with which record and a reproduction layer were provided, and the 2nd transparent substrate that has a feed hole an optical disc which makes UV cure adhesive intervene and was stuck, When manufacturing by UV irradiation, it is a pedestal used in order to carry out fixed holding of the substrate, So that accumulation to the extent that it becomes a factor which modification generates in the 1st substrate with which a pillar-shaped center pin which inserts in a feed hole and carries out fixed holding of the substrate is provided, and this center pin is arranged at least at the pedestal side may not happen to a pedestal, A pedestal for optical disc



manufacture being what has the structure which builds an interval to a pedestal side and the 1st substrate's face, and can carry out fixed holding of the 1st substrate", (2) -- with a pedestal for optical disc manufacture of a description in said \*\* (1) paragraph or a "pedestal for optical disc manufacture given in said \*\* (1) paragraph, wherein center pin is hollow structured" (3) \*\*\* (2) paragraph. A laminating apparatus for manufacture of an optical disc, wherein a black light is formed in the pillar-shaped center-pin side upper part of this pedestal", and (4) "a pillar-shaped center pin of a pedestal for optical disc manufacture of a description in said \*\* (1) paragraph or a \*\* (2) paragraph, Record and a reproduction layer are carried out inside for the 1st transparent substrate that has a feed hole and with which record and a reproduction layer were provided, and the 2nd transparent substrate that has a feed hole, It inserts in a feed hole one by one, fixed holding is carried out, and it is attained by a manufacturing method of an adhesion lamination type optical disc characterized by carrying out UV irradiation from the upper part of the 2nd substrate in the state where UV cure adhesive was made to exist between the 1st substrate and the 2nd substrate."

[0021]Namely, in order to avoid accumulation of a pedestal as mentioned above, this invention so that direct contact of the fixed holding position of an optical disc before hardening may not be carried out to a pedestal side, Structure where an interval is made between a field of the 1st substrate and a pedestal side at the time of fixed holding will be given to a pillar-shaped center pin of a pedestal, and fixed holding will be carried out only on the outskirts of a feed hole of the 1st substrate. It is effective, in order to become much more easy to radiate heat and to avoid accumulation of a pedestal, if a center pin is made into a hollow structured in addition to the aforementioned conditions. It is effective, in order to make a crevice between feed holes of the 1st substrate, to become much more easy to radiate heat and to avoid accumulation of a pedestal, if the surface of a center pin is furthermore made into rugged structure so that an outer diameter may be set to  $\phi 14.99\text{--}15\text{mm}$ . Although a part of pedestal is made, a center pin may be combined after molding into a different body, even if both really mold. Although there are no conditions about construction material of a pedestal and a center pin, if constituted from an especially thermally conductive high material, it is desirable although accumulation of a pedestal is avoided. Each part size of a pedestal and a center pin is not restrictive, and is influenced by diameter of a feed hole of an optical disc of a substrate to paste together.

[0022]A manufacturing method of a laminating apparatus using a pedestal and it which are used for manufacture of an optical disc of this invention, and an optical disc explained above is applicable to all conventionally publicly known optical discs of an adhesion bonding type that were explained by a paragraph of conventional technology of point \*\*. Therefore, a publicly known thing is conventionally applied also to conditions of the 1st substrate and the 2nd substrate. "Transparence" of the 1st substrate means having translucency to record

reproduction light, About a phase-change optical disk, it is light with a wavelength of about 635-780 nm, and 'transparency' of the 2nd substrate is a light which means having translucency to ultraviolet rays with which it irradiates for adhesive setting and to which wavelength usually makes about 400 nm a maximum. About polycarbonate as an example of the 2nd substrate, it has sufficient transparency also to which light. If only it satisfies conditions of a center pin of a pedestal which is the feature of this invention, a technical matter about a publicly known pedestal and a manufacturing installation is conventionally applicable.

[0023]

[Embodiment of the Invention]Examples are enumerated about structure where an interval is made in below between the field of the 1st substrate, and a pedestal side at the time of the fixed holding given to the pillar-shaped center pin of the pedestal. The example 1 is shown in drawing 6. It has the structure of holding a disk in contact with the 1st substrate on the upper surface of O-ring put on the side of a  $\phi 14.99$ -15mm center pin.

[0024]The example 2 is shown in drawing 7. It has the structure of holding a disk in contact with the 1st substrate on the upper surface of the level difference provided in the side of the  $\phi 14.99$ -15mm center pin.

[0025]The example 3 is shown in drawing 8. It has the structure of holding a disk in contact with the 1st substrate on the upper surface of O-ring put on the annular slot established in the upper surface of the level difference provided in the side of the  $\phi 14.99$ -15mm center pin.

[0026]The example 4 is shown in drawing 9. The section established in the upper surface of the level difference provided in the side of the  $\phi 14.99$ -15mm center pin has the structure of holding a disk in contact with the 1st substrate on the upper surface of triangular annular heights.

[0027]The example 5 is shown in drawing 10. It has the structure of holding a disk in contact with the 1st substrate with the taper formed in the lower part of the  $\phi 14.99$ -15mm center pin.

[0028]The example 6 is shown in drawing 11. It has the structure of holding a disk in contact with the 1st substrate by a tapered shape center pin.

[0029]The example 7 which made the center pin of the example 1 the hollow structured is shown in drawing 12. Caloric capacity falls by making into pipe shape the center pin shown in the examples 1-6, or making each part hollow, and the accumulation to a pedestal decreases. The incidence rate to which the curvature of the disk at the time of producing a disk continuously by the pedestal of a conventional example and the pedestal which has a center pin of the example 1, and adhesives are over (poor breadth) is shown in Table 1. The baton performed the mass production for 12 seconds, and the exposure for 10 seconds performed exposure conditions by illumination 1000 mJ/cm. When produced continuously using the pedestal of a conventional example, the incidence rate to which the curvature of a disk and adhesives are over gradually (poor breadth) increased, but. When it produced continuously

using the pedestal which has a center pin of the example 1, increase of the incidence rate to which the curvature of a disk and adhesives are over (poor breadth) was not seen.

[0030]

[Table 1]

生産枚数	ディスクの反り (従来例)	ディスクの反り (具体例 1)	引け発生率 (従来例)	引け発生率 (具体例 1)
1	0. 0 1°	0. 0 1°	0%	0%
1 0	0. 2°	0. 0 1°	0%	0%
5 0	0. 3°	0. 0 1°	3%	0%
1 0 0	0. 4°	0. 0 1°	5%	0%
5 0 0	0. 5°	0. 0 1°	1 0%	0%

[0031]

[Effect of the Invention]As mentioned above, from detailed and concrete explanation so that clearly the adhesion bonding type optical disc laminating apparatus from a book, So that there may be no pedestal accumulation from which this center pin becomes a factor which makes a substrate generate curvature, By being what has the structure which builds an interval to a pedestal side and the base side of the 1st substrate, and can carry out fixed holding of the substrate, The touch area of a pedestal and the 1st substrate decreases, there is no modification of the disk by heat conduction from a pedestal to the 1st substrate, and the device which can manufacture cheaply the adhesion bonding type optical disc excellent in a mechanical characteristic and preservation reliability can be provided.

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TECHNICAL FIELD

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PRIOR ART

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an elimination ratio to become good, that which can cause the phase change of a crystal-amorphous interphase and in which each can take stabilization or a metastable-ized state is suitable. It not only can record and eliminate, but as a phase change type optical recording reproduction layer, the life (reliability) of the reproduction stability of a signal when it records in high density and a high-linear-velocity field, or a signal is required simultaneously. As a phase change type optical recording reproduction layer which can satisfy these synthetically, GeSbTe, AgInSbTe, GeInSbTe, etc. which use SbTe as the main ingredients are commercialized.

[0006]As thickness of a record reproduction layer, it is good to be suitably referred to [ 10-50-nm ] as 12-30 nm, and when initial characteristics, such as a jitter, an overwrite characteristic, and mass production efficiency are taken into consideration, it is still more preferred to be referred to as 14-25 nm. When it becomes thinner than 10 nm, there is a tendency for optical absorption ability to fall remarkably and to stop playing a role of a record reproduction layer. When thicker than 50 nm, there is a tendency for a uniform phase change to become difficult to happen at high speed. Such a record reproduction layer can be formed with various vapor phase growth, for example, a vacuum deposition method, sputtering process, plasma CVD method, an optical CVD method, the ion plating method, electron beam evaporation method, etc. Especially, sputtering process is excellent in mass production nature, membraneous quality, etc.

[0007]Although it is usually an about about 0.6\*\*0.05-mm thing although the thickness of the base (11) used for the 1st substrate is not restrictive, and glass, ceramics, or resin is used as construction material, a resin thing is preferred in respect of moldability and cost. As resin, although polycarbonate resin, an acrylic resin, an epoxy resin, polystyrene resin, acrylonitrile styrene copolymer resin, polyethylene resin, polypropylene resin, silicon system resin, fluororesin, ABS plastics, urethane resin, etc. are mentioned, Polycarbonate resin, acrylic resin, etc. are preferably used especially in respect of moldability, an optical property, and cost.

[0008]A protective layer (12) has the function to adjust the heat of a record reproduction layer, and an optical property with protection of a record reproduction layer, The thickness of the 1st protective layer (12) formed between the plastic plate (11) and the recording layer (13) is good to be referred to as 65-130 nm, and good to be suitably referred to [ 10-40-nm ] as 15-35 nm as the 2nd protective layer (12) formed between the recording layer (13) and the metal layer (14). As a material which constitutes a protective layer (12), metallic oxides, such as SiO, SiO<sub>2</sub>, ZnO, SnO<sub>2</sub>, aluminum<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, In<sub>2</sub>O<sub>3</sub>, MgO, and ZrO<sub>2</sub>, Nitrides, such as Si<sub>3</sub>N<sub>4</sub>, AlN, TiN, BN, and ZrN, Carbide, and diamond-like carbon or those mixtures, such as sulfides, such as ZnS, In<sub>2</sub>S<sub>3</sub>, and TaS<sub>4</sub>, SiC, TaC, B<sub>4</sub>C, WC, TiC, and ZrC, are mentioned. Although such materials can also be alone made into a protective layer, they are good also as a mutual

mixture. An impurity may also be included if needed. A dielectric layer can also be multilayered if needed. However, the melting point needs to be higher than a record reproduction layer. As such a material, it can form with various vapor phase growth, for example, a vacuum deposition method, sputtering process, plasma CVD method, an optical CVD method, the ion plating method, electron beam evaporation method, etc. Especially, sputtering process is excellent in mass production nature, membraneous quality, etc.

[0009]As a material of a metal layer (14), metallic materials, such as Ag, Au, Pt, aluminum, Ta, and Cu, or those alloys can be used. As an alloying element, Cr, Ti, Si, Cu, Ag, Pd, Ta, etc. are used. Such a metal layer can be formed with various vapor phase growth, for example, a vacuum deposition method, sputtering process, plasma CVD method, an optical CVD method, the ion plating method, electron beam evaporation method, etc. As thickness of a metal layer, it is good to be suitably referred to [ 70-200-nm ] as 100-160 nm.

[0010]As a material of an organic protective layer (15), the acrylic (meta) ultraviolet curing type resin etc. which were produced in the spin coat are common, and it presses down so that a recording layer (13) may not be destroyed at the time of oxidation protection of a reflection film (14) and initialization. 5-15 micrometers is suitable for the thickness.

[0011]As for a glue line (16), acrylic (meta) UV cure adhesive is used preferably, and a glue line (16) may serve as an organic protective layer (15).

[0012]Being used in order that a protective group board (17. the 2nd substrate) may give a high mechanical strength to an optical disc, and using the thing about about  $0.66 \times 0.05$  mm thick made from a plastic may use the same thing as the base (11) unproduced a film preferably.

[0013]The record reproduction layer membrane (13) is usually initialized in one of stages, before and after pasting a protective group board (the 2nd substrate (17)) together via a glue line (16). Although lamination of the protective group board (the 2nd substrate) is performed using hot melt adhesive, cationic polymerization nature adhesives, radical polymerization nature adhesives, etc., the UV cure adhesive which is one of the radical polymerization nature adhesives is especially used widely from the field of the cost of material and a laminating apparatus.

[0014]Next, although the example of a series of work which pastes together the 1st substrate (the substrate arranged to the pedestal side is said) and the 2nd substrate is explained using the conventional laminating apparatus, It is known that the laminating operation mentioned here can be applied also to the optical disc of not only a phase change record type but other recording methods. Usually, as laminating operation is shown in drawing 3, four positions of supply, exposure, discharge, and cooling are patrolled, it is advanced, and exposure is performed by the conventional black light shown in drawing 2. To first, the film surface of the disc-like plastic plate (the 1st substrate) which produced the record reproduction layer. After

really which piles up a protective group board (the 2nd substrate) and is formed after applying UV cure adhesive preparing a thing, It arranges so that eccentricity of the thing may not really [ this ] be mechanically carried out to the  $\phi 14.99$ -15mm pillar-shaped center pin (22) provided in the center of a pedestal (21) in the supplying position shown in drawing 3 using  $\phi 15$  - the 15.01-mm feed hole which were established in both boards.

[0015]In the place where adhesives spread between substrates in prudence and capillarity of the protective group board (the 2nd substrate). It irradiates with the ultraviolet rays (dashed line arrow) which used mercury or a metal halide lamp (23) as the light source, and were collected with the reflective condensing plate (24) from the protective group board (2nd substrate) side upper part, and the light which penetrated the protective group board (the 2nd substrate) reaches adhesives, and stiffens them, and adhesion is completed. After the laminating operation explained above had arranged the 2nd substrate after applying adhesives on the 1st substrate arranged on a pedestal, it was performed in an order which carries out UV irradiation, but. After arranging the 1st substrate and the 2nd substrate one by one on a pedestal, and injecting adhesives into the 1st substrate and the 2nd substrate from between, carrying out UV irradiation is also known. It is publicly known that there is a disk which provided the record reproduction layer not only in the 1st substrate but in the 2nd substrate.

[0016]However, if laminating operation is done using the pedestal for the conventional substrate fixed holding as shown in drawing 4, the large disk of modification like curvature is made and the interval of a substrate spreads in an inner periphery further -- adhesives -- being over (poor breadth) -- it occurs, and does not remain in an appearance defect, but becomes a factor of peeling of adhesives, and the reliability of a disk may be reduced. Although it is possible as modification preventive measures to take long cool time, It is considered as the method of a tact time becoming long, productivity worsening, and it being connected with a cost hike, and also taking long cool time, and also becomes increasing the number of stages of a pedestal or adding the cooler style of air cooling and water cooling, and equipment will become large-scale and will be this and a cost hike.

[0017]Many things are proposed from the former as such modification preventive measures besides taking long cool time. For example, to JP,2001-84654,A, the method of carrying out UV irradiation is indicated, pressing the flat member of a light transmittance state lightly to a substrate, and correcting it mechanically to it reducing heat modification of the substrate at the time of UV irradiation. To JP,2001-14736,A. Before pasting the 1st substrate and the 2nd substrate together by UV irradiation, if it back-cools, the purport that the substrate made a peculiar target and the curvature which it has potentially reveal beforehand by heat treatment and that heat-treats and it is pressed down by generating of slight curvature as compared with a case is indicated. However, these do not bring about sufficient effect for the curvature occurrence prevention of a substrate.



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EFFECT OF THE INVENTION

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[Effect of the Invention]As mentioned above, from detailed and concrete explanation so that clearly the adhesion bonding type optical disc laminating apparatus from a book, So that there may be no pedestal accumulation from which this center pin becomes a factor which makes a substrate generate curvature, By being what has the structure which builds an interval to a pedestal side and the base side of the 1st substrate, and can carry out fixed holding of the substrate, The touch area of a pedestal and the 1st substrate decreases, there is no modification of the disk by heat conduction from a pedestal to the 1st substrate, and the device which can manufacture cheaply the adhesion bonding type optical disc excellent in a mechanical characteristic and preservation reliability can be provided.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention]SUBJECT of this invention can control modification of the curvature etc. which are produced when solving and pasting this problem together, and the adhesives leading to peeling of adhesives -- being over (poor breadth) -- there being nothing and, It is providing the manufacturing method of the laminating apparatus using the pedestal and it which use the adhesion bonding type optical disc which was excellent in a mechanical characteristic and preservation reliability as a result for the fixed holding of a substrate whose manufacture is moreover enabled at low cost, and an optical disc.

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## MEANS

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[Means for Solving the Problem]this invention person examined a factor which modification of curvature of a substrate, etc. generates. Direct contact is carried out to a field of a pedestal, it is fixed to it, and an optical disc (said one thing) before hardening supplied to the conventional pedestal as shown in drawing 4 in a supplying position shown in drawing 3 moves to an exposure position, and after UV irradiation is carried out there, adhesives harden, and are stuck and it becomes a product, it is removed in a discharge position. After that, although it is cooled in a cooling position and a pedestal is returned to the original supplying position, If it is continuously repeated in order that these work of a series of may produce many optical disc products, In order to check that heat will be gradually accumulated in a pedestal, and for the accumulation to become a factor, to expand, and for the 1st substrate fixed to a field of a pedestal by carrying out direct contact to be in a state like drawing 5 and to harden adhesives of an adhesion side between substrates in an instant mostly further, When exposed in this state, it became clear that an optical disc with modification was manufactured.

[0020]This invention is made based on such an analysis result, and an aforementioned problem, (1) of this invention "the 1st transparent substrate that has a feed hole and with which record and a reproduction layer were provided, and the 2nd transparent substrate that has a feed hole an optical disc which makes UV cure adhesive intervene and was stuck, When manufacturing by UV irradiation, it is a pedestal used in order to carry out fixed holding of the substrate, So that accumulation to the extent that it becomes a factor which modification generates in the 1st substrate with which a pillar-shaped center pin which inserts in a feed hole and carries out fixed holding of the substrate is provided, and this center pin is arranged at least at the pedestal side may not happen to a pedestal, A pedestal for optical disc manufacture being what has the structure which builds an interval to a pedestal side and the 1st substrates face, and can carry out fixed holding of the 1st substrate", (2) -- with a pedestal for optical disc manufacture of a description in said \*\* (1) paragraph or a "pedestal for optical

disc manufacture given in said \*\* (1) paragraph, wherein center pin is hollow structured" (3) \*\*\* (2) paragraph. A laminating apparatus for manufacture of an optical disc, wherein a black light is formed in the pillar-shaped center-pin side upper part of this pedestal", and (4) "a pillar-shaped center pin of a pedestal for optical disc manufacture of a description in said \*\* (1) paragraph or a \*\* (2) paragraph, Record and a reproduction layer are carried out inside for the 1st transparent substrate that has a feed hole and with which record and a reproduction layer were provided, and the 2nd transparent substrate that has a feed hole, It inserts in a feed hole one by one, fixed holding is carried out, and it is attained by a manufacturing method of an adhesion lamination type optical disc characterized by carrying out UV irradiation from the upper part of the 2nd substrate in the state where UV cure adhesive was made to exist between the 1st substrate and the 2nd substrate."

[0021]Namely, in order to avoid accumulation of a pedestal as mentioned above, this invention so that direct contact of the fixed holding position of an optical disc before hardening may not be carried out to a pedestal side, Structure where an interval is made between a field of the 1st substrate and a pedestal side at the time of fixed holding will be given to a pillar-shaped center pin of a pedestal, and fixed holding will be carried out only on the outskirts of a feed hole of the 1st substrate. It is effective, in order to become much more easy to radiate heat and to avoid accumulation of a pedestal, if a center pin is made into a hollow structured in addition to the aforementioned conditions. It is effective, in order to make a crevice between feed holes of the 1st substrate, to become much more easy to radiate heat and to avoid accumulation of a pedestal, if the surface of a center pin is furthermore made into rugged structure so that an outer diameter may be set to  $\phi 14.99\text{--}15\text{mm}$ . Although a part of pedestal is made, a center pin may be combined after molding into a different body, even if both really mold. Although there are no conditions about construction material of a pedestal and a center pin, if constituted from an especially thermally conductive high material, it is desirable although accumulation of a pedestal is avoided. Each part size of a pedestal and a center pin is not restrictive, and is influenced by diameter of a feed hole of an optical disc of a substrate to paste together.

[0022]A manufacturing method of a laminating apparatus using a pedestal and it which are used for manufacture of an optical disc of this invention, and an optical disc explained above is applicable to all conventionally publicly known optical discs of an adhesion bonding type that were explained by a paragraph of conventional technology of point \*\*. Therefore, a publicly known thing is conventionally applied also to conditions of the 1st substrate and the 2nd substrate. "Transparence" of the 1st substrate means having translucency to record reproduction light, About a phase-change optical disk, it is light with a wavelength of about 635-780 nm, and "transparence" of the 2nd substrate is a light which means having translucency to ultraviolet rays with which it irradiates for adhesive setting and to which

wavelength usually makes about 400 nm a maximum. About polycarbonate as an example of the 2nd substrate, it has sufficient transparency also to which light. If only it satisfies conditions of a center pin of a pedestal which is the feature of this invention, a technical matter about a publicly known pedestal and a manufacturing installation is conventionally applicable.

[0023]

[Embodiment of the Invention] Examples are enumerated about structure where an interval is made in below between the field of the 1st substrate, and a pedestal side at the time of the fixed holding given to the pillar-shaped center pin of the pedestal. The example 1 is shown in drawing 6. It has the structure of holding a disk in contact with the 1st substrate on the upper surface of O-ring put on the side of a  $\phi 14.99\text{-}15\text{mm}$  center pin.

[0024] The example 2 is shown in drawing 7. It has the structure of holding a disk in contact with the 1st substrate on the upper surface of the level difference provided in the side of the  $\phi 14.99\text{-}15\text{mm}$  center pin.

[0025] The example 3 is shown in drawing 8. It has the structure of holding a disk in contact with the 1st substrate on the upper surface of O-ring put on the annular slot established in the upper surface of the level difference provided in the side of the  $\phi 14.99\text{-}15\text{mm}$  center pin.

[0026] The example 4 is shown in drawing 9. The section established in the upper surface of the level difference provided in the side of the  $\phi 14.99\text{-}15\text{mm}$  center pin has the structure of holding a disk in contact with the 1st substrate on the upper surface of triangular annular heights.

[0027] The example 5 is shown in drawing 10. It has the structure of holding a disk in contact with the 1st substrate with the taper formed in the lower part of the  $\phi 14.99\text{-}15\text{mm}$  center pin.

[0028] The example 6 is shown in drawing 11. It has the structure of holding a disk in contact with the 1st substrate by a tapered shape center pin.

[0029] The example 7 which made the center pin of the example 1 the hollow structured is shown in drawing 12. Calorific capacity falls by making into pipe shape the center pin shown in the examples 1-6, or making each part hollow, and the accumulation to a pedestal decreases. The incidence rate to which the curvature of the disk at the time of producing a disk continuously by the pedestal of a conventional example and the pedestal which has a center pin of the example 1, and adhesives are over (poor breadth) is shown in Table 1. The baton performed the mass production for 12 seconds, and the exposure for 10 seconds performed exposure conditions by illumination  $1000\text{ mJ/cm}$ . When produced continuously using the pedestal of a conventional example, the incidence rate to which the curvature of a disk and adhesives are over gradually (poor breadth) increased, but. When it produced continuously using the pedestal which has a center pin of the example 1, increase of the incidence rate to which the curvature of a disk and adhesives are over (poor breadth) was not seen.

[0030]

[Table 1]

生産枚数	ディスクの戻り (従来例)	ディスクの戻り (具体例 1)	引け発生率 (従来例)	引け発生率 (具体例 1)
1	0.01°	0.01°	0%	0%
10	0.2°	0.01°	0%	0%
50	0.3°	0.01°	3%	0%
100	0.4°	0.01°	5%	0%
500	0.5°	0.01°	10%	0%

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]It is a sectional view of an adhesion bonding type optical disc in phase change record type.

[Drawing 2]It is a figure showing the conventional black light.

[Drawing 3]It is a figure showing the pedestal which patrols supply, exposure, discharge, and four positions of cooling.

[Drawing 4]It is a sectional view of the conventional pedestal.

[Drawing 5]It is a figure showing the state where heat was accumulated in the pedestal and the 1st substrate expanded.

[Drawing 6]It is a figure showing the example 1 of center-pin structure.

[Drawing 7]It is a figure showing the example 2 of center-pin structure.

[Drawing 8]It is a figure showing the example 8 of center-pin structure.

[Drawing 9]It is a figure showing the example 4 of center-pin structure.

[Drawing 10]It is a figure showing the example 5 of center-pin structure.

[Drawing 11]It is a figure showing the example 6 of center-pin structure.

[Drawing 12]It is a figure showing the example 7 of an example of center-pin structure.

[Description of Notations]

11 Plastic plate

12 Protective layer

13 Recording layer

14 Metal layer

15 An organic protective layer

16 Glue line

17 Protective group board

20 Disk



21 Pedestal

22 Center pin

23 Mercury or a metal halide lamp

24 Reflective condensing plate

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[Translation done.]

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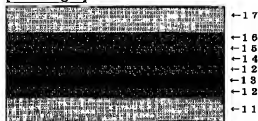
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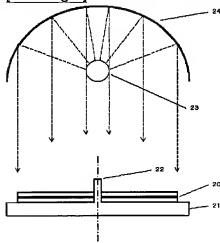
DRAWINGS

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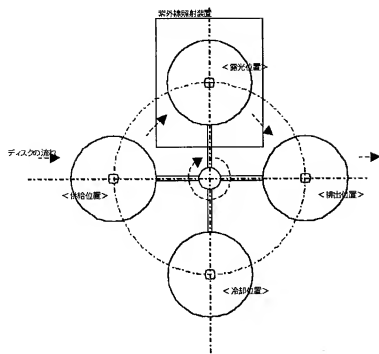
[Drawing 1]



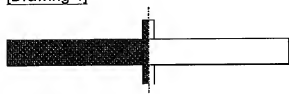
[Drawing 2]



[Drawing 3]



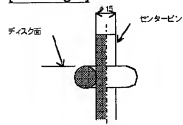
[Drawing 4]



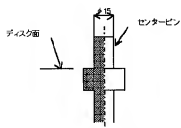
[Drawing 5]



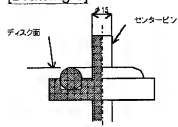
[Drawing 6]



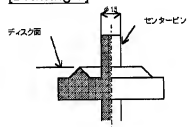
[Drawing 7]



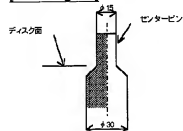
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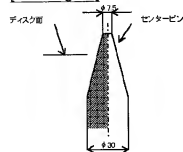
[Drawing 9]



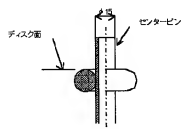
[Drawing 10]



[Drawing 11]



[Drawing 12]



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[Translation done.]